

# ATOMIC ENERGY

THE FIRST AND ONLY

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Dear Sir:

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A new British nuclear reactor, to generate electrical energy, is now to be built at Dounreay, in Caithness, Scotland, Sir David Eccles, British Minister of Works stated in Parliament last fortnight in London. It will be a fast reactor, of the breeder type, and larger in capacity than the other nuclear power plant which is being constructed at Calder Hall, near Seascale, in Cumberland, he pointed out. He said it was the opinion of informed individuals in the field of nuclear energy that the most important use of such energy would be for the generation of electricity. The occasion for Sir David's appearance was the second reading of Britain's Atomic Energy Authority bill, which would transfer control over the non-military aspects of nuclear energy development from the Ministry of Supply to a new government-owned authority. In explaining how the new authority would function, Sir David said that the authority, under the supervision of the Lord President of the Council, would be concerned with research and the development of nuclear reactors, and with engineering work, before the civil application of nuclear energy reached the commercial stage. After this stage, he noted, industry would take over. Britain's annual expenditures on nuclear energy are now more than £ 50,000,000, Sir David stated, and the figure will continue to rise, he predicted.

The explosion last week of a nuclear device, at the USAEC's proving ground in the Marshall Islands, marked the forty-sixth detonation by the United States of such devices. The explosion also marked the beginning of the Spring series of tests in the proving ground area; the period between March and May is less likely to experience typhoons, and the weather is thus the determining factor. This test period will also see a detonation of one or more thermonuclear devices, the development of which has been enormously accelerated in the United States; latest thermonuclear devices now use only small amounts of tritium, and larger amounts of lithium or other light elements.

A new uranium field in Canada, near Montreal is now being explored by the Molybdenum Corp. of America, first company to undertake work in the area, although other companies have come in following Molybdenum's initial work. Molybdenum has taken under option some 8,000 acres near Oka, 43 miles west of Montreal, along the north shore of the Lake of Two Mountains. Officials of the company state that both uranium and thorium are present, as well as columbium and tantalum. (Additional news of RAW MATERIALS, in United States and Canada, page 4 this LETTER.)

Bids on the construction of buildings and service facilities for the initial engine test area of the aircraft nuclear propulsion project, at the Reactor Testing Station (Idaho Falls, Idaho) will be opened March 31st, it has now been learned. The job is estimated to range between \$2.5 and \$3 million; the contract will be awarded to one bidder. This week, on March 10th, a pre-bidding conference will be conducted at the USAEC's offices in Idaho Falls for all interested contractors and sub-contractors.

BUSINESS NEWS...in the nuclear energy field...

URANIUM MINING BONUS PAYMENTS OVER \$3 MILLION:- More than \$3 million has been paid uranium miners in the United States in the form of bonus for uranium production from eligible properties since this bonus for initial production was put into effect March 1st, 1951, figures released from the USAEC's Grand Junction, Colo., office now show. Bonus payments are being made at the rate of approximately \$175,000 per month. (The initial production bonus has been in effect for a little less than three years, and helps defray a part of the high initial cost of putting a mine into production. Bonus payments double the base price for the first 10,000 pounds of contained uranium oxide produced and sold from any new property, and amount to a bonus of between \$15,000 and \$35,000, depending on grade, for first production from new properties. To date, 50 new properties have produced more than the initial 10,000 pounds of uranium.)

BUSINESS ASPECTS OF NUCLEAR ENERGY TO BE DISCUSSED:- A meeting devoted to "Business Opportunities in Atomic Energy", sponsored by the Atomic Industrial Forum, New York, is to be held in New York March 15-16. Some twenty-four individuals, representing companies now involved in atomic energy activities, research organizations, and divisions of the USAEC, will speak at this meeting. Discussions will cover: (1) "Present Uses of Radioactive Materials", with speakers from Tracerlab, Inc., Technical Operations, Inc., Arthur D. Little, Inc., and U. S. Radium Corp. (2) "Potential Industrial Applications of Atomic Energy", with speakers from North American Aviation, Inc., University of Utah, Brookhaven National Laboratory, Massachusetts Institute of Technology, and Abbott Laboratories. (3) "Non-Profit Research Facilities", with speakers from Brookhaven National Laboratory, University of Michigan, Stanford Research Institute, Battelle Memorial Institute, and Armour Research Institute. (4) "Consulting & Nuclear Engineering Services", with the speaker from Food Machinery & Chemicals Corp. (5) "Government Services to Industry", by speakers from the USAEC. (6) "New Materials", with speakers from M. W. Kellogg Co., and Carborundum Metals Co., Inc. (7) "Products Required by Atomic Energy Program", with speakers from the USAEC and Union Carbide & Carbon Corp.

ENGINEERING FIRM OFFERS NUCLEAR REACTOR:- Designs for a nuclear reactor have been completed by the Babcock & Wilcox Co., that engineering firm has now announced. The firm will submit bids on the manufacture and installation of the reactor in the United States. It believes that construction costs of its reactor are below that of any previously offered similar reactors. This Babcock & Wilcox reactor, which is offered as a research tool for any organization or university engaged in nuclear energy research, utilizes uranyl sulfate as "fuel", and it is expected that it will produce 100 kw. of heat energy.

NEW COLOR CODES FOR NUCLEAR INDUSTRY:-The new American Standard Color Code, which has just been revised and released to industry, has adopted high visibility purple for radiation perils, as one of its three new colors to warn workers of potential dangers. (This color was adopted into the code from the USAEC, which uses it in its familiar broken-propeller-shaped symbol). The code suggests that purple be used in rooms and areas, indoors and outdoors, where radioactive materials are stored and handled. Burial grounds for this material, and contaminated equipment are also marked by this color. Purple signal lights may be used, the code suggests, to indicate when radiation-producing machines are in operation. (The code may be obtained from the American Standards Association, 70 E. 45th St., New York 17, at 50¢ per copy.)

BOOKS & OTHER PUBLICATIONS...on nuclear subjects...

Recent Attempts to Alter Response to Ionizing Radiations (with bibliography); work done at University of California, Los Angeles. (60¢).....Laboratory Handbook of Nuclear Microscopy; compiled at Los Alamos Scientific Laboratory (55¢)..... Assaying Techniques for Radioisotopic Contaminants in Water Supplies; from Sedgewick Laboratories of Sanitary Science, MIT (60¢).....All of above are obtainable from Office of Technical Services, Washington 25, D. C., at prices indicated.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS:- Special container for radioactive wastes, trade-named Raysist. Made of the firm's Ferrolum (lead-clad) steel, which is said to combine the high molecular density and shielding properties of lead, with the strength of steel. This bond (between the lead and steel) is said to be capable of withstanding heat up to 621 degrees F. The container, or vault, is equipped with stabilizing lugs on the bottom, and a steel lifting lug on the top, while the cap may be screwed and locked into place. --Knapp Mills, Inc., Long Island City, N. Y.

Universal counter and timer, Model 5510. A new direct reading counter, said to be capable of measuring and indicating time intervals from 3 microseconds to 1,000,000 seconds, with a maximum accuracy of plus-or-minus 1 microsecond. Manufacturer states that this instrument can measure and indicate frequencies from 0 cycles to 1 megacycle with a maximum accuracy of plus-or-minus 1 cycle. --Berkeley Div., Beckman Instruments, Inc., Richmond, Calif.

NOTES: Drugs, surgical instruments, and sutures can be protected for long periods against damage, or their useful lives considerably extended, through the use of high energy electrons, Herbert M. Schreiber, General Electric Co., Milwaukee, told a meeting of the American Pharmaceutical Manufacturer's Association, held in Chicago recently. Describing the results of experiments performed to date, Mr. Schreiber outlined what now appears to be the three main applications of this form of radiation in the medical field: (1) extending the life of antibiotics by destroying or checking mold formation, (2) extending the life of sharp surgical instruments by sterilizing them without use of extreme heat, which dulls the edges, and (3) heatless sterilization of sutures after they have been packaged and sealed. At the present time, however, no commercial installations are actually in operation. There are, the speaker pointed out, many problems in such irradiation sterilizing. When used with foods, he observed, the high energy is sufficient to produce chemical changes with the inevitable flavor changes; use with drugs may cause changes difficult to evaluate. The speaker noted that the heavy shielding required is to afford protection from secondary x-rays given off during irradiation, since the cathode rays themselves could be absorbed in about one-quarter of an inch of water. The usual shielding used is about twenty inches of concrete. A consideration to be taken into account, Mr. Schreiber pointed out, is the geometrical configuration of the package, as well as the container material, since the first may affect the penetration of the radiation, and in the second instance physical changes may be induced in the container material which may be undesirable.

New data on the properties of hafnium carbide has been provided by recent work conducted by the ceramics department of Oak Ridge National Laboratory. (While hafnium carbide is still in the laboratory stage, it has become of interest in recent years for possible application in high temperature work in certain applications in nuclear reactors.) The hafnium carbide tested at ORNL for use as a refractory material was synthesized from carbon and pure hafnium oxide available at the laboratory. X-ray diffraction studies showed the cell structure of hafnium carbide to be of the cubic type, similar to sodium chloride. Micro hardness tests showed hafnium carbide to compare favorably with carbides in use in industry today. It has also been determined that finely powdered hafnium carbide can be hot-pressed into desired shapes in graphite dies at pressures on the order of 1500 pounds per square inch and temperatures in the vicinity of 2000 deg. C.

PEOPLE...in the nuclear energy program...

New director of the Boulder, Colo., laboratories of the National Bureau of Standards will be Frederick W. Brown. Among his responsibilities at Boulder will be the direction of the NBS-USAEC cryogenics engineering laboratory, which conducts a research program for the USAEC and the U. S. Air Force. Dr. Brown has directed and participated in programs concerned with nuclear reactors, weapons, explosives, and explosions.

In a series of corporate appointments within Vitro Corp. of America (nuclear engineering, uranium mining and refining company) W. B. Hall has been named general manager of Vitro Uranium Co., which processes uranium ore on the Colorado Plateau for the USAEC; F. H. Bivins has been named general manager of Vitro Rare Metals Co.; and G. R. Tatum has been appointed general manager of Vitro Laboratories.



SCIENTIFIC MEETINGS...with papers on nuclear subjects...

INSTITUTE OF RADIO ENGINEERS:- The Institute's national convention (New York, March 22-25, inclusive) will have a symposium on nuclear science lasting one day. Papers to be presented include:-Non-Reactor Electronics at Oak Ridge, by P. R. Bell; Brookhaven Electronics Work, by W. A. Higinbotham; Non-Reactor Electronics Work at Argonne, by T. Brill; Non-Reactor Electronics at Los Alamos, by R. J. Watts; Simulators, by K. H. Fischbeck; Safety Aspects of Control Circuitry, by T. Cole; Instruments Used with Experimental Reactors, by E. J. Wade; Synthesis of Nuclear Control Systems, by N. Grace. In addition, a meeting on medical electronics will include a paper by R. K. Mortimer, H. O. Anger, and C. A. Tobias on Visualization of the Distribution of Gamma Emitters in-vivo By Means of the Gamma Ray Pinhole Camera and Image Amplifier; and Measurement of Slow Neutron Depth Doses, by E. Stickley.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS: A non-technical symposium on technical and patent aspects of industrial atomic power development is part of the AICHE's national meeting now being held in Washington, D. C. (March 7-10, inclusive). A status report on industrial atomic power, by L. R. Hafstad, director of the reactor division, USAEC, covers the current technical status, the present technical and non-technical problems, and the future outlook of nuclear energy as a source of industrial power. Lessons learned from the operation of the various completed reactors, so far as they bear upon the future program of reactor development, are part of this discussion. In a discussion of the changes that should be made in the Atomic Energy Act (1946), the USAEC's viewpoint will be presented by G. F. Trowbridge, USAEC; the industry viewpoint by E. J. Putzell, Jr., Monsanto Chemical Co.; and the public viewpoint by T. S. Kenyon, chairman of the atomic energy committee of the New York Patent Law Association.

In one of the technical sessions, B. Manowitz, R. H. Bretton, and R. V. Horrigan, Brookhaven National Laboratory, N. Y., will discuss The Occurrence and Control of Radioactive Entrainment in Evaporative Systems. Their paper will concern the study which was made at Brookhaven of entrainment generation in a submerged coil evaporator and a vertical-tube natural circulation evaporator, where it was found that both evaporators generated about the same amount of entrainment at comparable boil-up rates, and that the decontamination efficiency of a submerged coil evaporator is correlated to the boil-up rate. They will also go into the efficiency of a bubble-cap column, a Raschig ring packed tower, and a glass wool packed tower as de-entrainment devices, pointing out that in their studies the glass wool packed tower proved to be the most effective.

RAW MATERIALS...radioactive mineral and ore developments...

UNITED STATES:- A 10-claim property, in the Big Indian area near Moab, Utah, (near the original uranium find in this area, that made by Charles Steen at the M1 Vada ground) has now been sold by Simpson Mining Co., and Engineers Associates, Inc., both of Grand Junction, to a group including A.K. Swan, Evansville, Ind., attorney, and R. L. Bauman, Dallas, Texas, oil man. (This property is also near the Big Buck ground, sold by Charles Steen and his associates recently to a syndicate headed by Joseph Frazier, former auto manufacturer, for some \$2 million.).....Reports of a vein of high grade uranium ore, some 9-feet in width, averaging 11-feet deep, have now been made by an officer of Capitol Uranium Co., who stated that the find was in the Slick Rock area, in San Juan county, Utah. The company, which was set up last Fall, has 105 claims on 2,100 acres, most of which are located in eastern Utah, and southwestern Colorado.

CANADA:-The uranium deposit of Algom Uranium Mines in the Quirke Lake sector of Ontario's Blind River area is being tested to a depth of about 1,000 ft. the company has now reported. The company said that values at 1,000 feet are better than the average secured from one tier of holes drilled over a length of 8,000 feet at a shallower depth.....Underground work will soon be under way on the Ace property of Radiore Uranium Mines, which is under lease to Eldorado Mining and Refining, the Canadian-government-owned uranium mining concern. Rapid progress is underway on a new shaft which is being sunk to develop a drill-indicated ore zone.

ATOMIC PATENT DIGEST...latest U. S. grants in the nuclear field...

Process for the production of fluorinated diketones. In a process for the production of thenoyltrifluoroacetone, the steps of reacting an alkali metal methoxide with ethyl trifluoroacetate in the presence of a liquid paraffinic hydrocarbon as a reaction medium, adding acetothienone to the resulting mixture, and reacting the acetothienone with the product of the first reaction, whereby an alkali metal salt of thenoyltrifluoroacetone is formed and precipitates from the reaction mixture. U. S. Pat. No. 2,670,353 issued Feb. 28th, 1954; assigned to United States of America (USAEC).

Electromagnetic fluid pump, comprising (in part) an annular polyphase magnetic structure and a fluid duct, this magnetic structure comprising an outer annular magnetic member and an inner annular magnetic member, these members being supported with a space between them. A polyphase electrical winding is supported on the magnetic structure to create a rotating magnetic field which radially traverses the space between the magnetic members. The fluid duct has a first diverging portion, a second diverging portion, and an annular portion. Means electrically connect the free end of the diverging portion, and annular portion, whereby the pump, when electrically energized, causes rotation of electrically conductive fluid in the duct. U. S. Pat. No. 2,669,931 issued Feb. 23rd, 1954; assigned to United States of America (USAEC).

Coupling stage for distributed amplifier stages. In a distributed amplifier comprising a pair of stages, the improvement (in part) comprising means for coupling signals between the stages while isolating the output terminals of the plate lines to prevent termination of them, whereby the effective impedance driven by each amplifier tube is maintained at substantially the characteristic impedance. U. S. Pat. No. 2,670,408 issued Feb. 23rd, 1954; assigned to United States of America (USAEC).

Accelerator target holder, comprising (in part) a fluid-cooled beam collimating flange assembly to be hermetically mounted on the exit wall of an accelerator. The assembly includes a relatively massive, conically apertured wall flange adjacent the exit beam of this accelerator, an intermediate flange plate sufficiently spaced from this flange to provide a coolant chamber, and conduit means connected to the chamber for the circulation of a fluid coolant through it. U. S. Pat. No. 2,670,440 issued Feb. 23rd, 1954; assigned to United States of America (USAEC).

Alpha particle counter. Comprises a wafer of germanium, a point contact bearing against one face of the germanium, a substantially ohmic connection to the opposite face of this body, a source connected between the contact and the connection for establishing a biasing field of the order of two volts in the reverse direction across the barrier layer below this contact, and an indicating circuit including a high frequency amplifier having its input circuit connected between the contact and the connection, with the capacitance of this input circuit being very large in comparison with the capacitance of the barrier layer. U. S. Pat. No. 2,670,441 issued Feb. 23rd, 1954; assigned to Bell Telephone Laboratories, Inc., New York, N.Y.

Radiation beam forming unit comprising (in part) a shield having an internal chamber for holding a radioactive source, this shield having a collimating slot extending from an external wall into the chamber for forming radiations from the source into a beam, and a second slot transversely intersecting the collimating slot. A shutter is movably mounted in this second slot, it being shiftable from a closed position shielding the collimating slot and interrupting the beam, to another position leaving the slot clear for the passage of the beam. Both the shield and the shutter are composed of radiation absorbing material. The second slot is so located that normally it will be closed by gravity. U. S. Pat. No. 2,670,443 issued Feb. 23rd, 1954; assigned to Tracerlab, Inc., Boston, Mass.

Sincerely,

The Staff,  
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